

WHAT IS CLAIMED IS:

1. An isolated, purified or recombinant nucleic acid encoding an mTERT protein, said protein defined as follows:

- 5 (i) having a calculated molecular weight of between about 50 and 150 kDa; and
 (ii) (a) specifically binding to an antibody that binds a protein comprising SEQ ID NO:2, or a subsequence thereof; or
 (b) having at least 60% amino acid sequence identity to a protein comprising SEQ ID NO:2.

10 2. The isolated, purified or recombinant nucleic acid of claim 1, wherein the calculated molecular weight of the encoded mTERT protein is about 127 kDa.

15 3. The isolated, purified or recombinant nucleic acid of claim 1, wherein the encoded mTERT protein has an amino acid sequence of SEQ ID NO:2.

4. The nucleic acid of claim 1 comprising a nucleotide sequence encoding at least about five contiguous amino acids of an mTERT.

20 5. An isolated, purified or recombinant peptide encoded by the nucleic acid of claim 1.

6. An isolated, purified or recombinant mTERT protein, said protein:

- 25 (i) having a calculated molecular weight of about 50 to 150 kDa; and
 (ii) (a) specifically binding to an antibody raised against a mTERT protein comprising SEQ ID NO:2, or subsequence thereof; or
 (b) having 60% amino acid sequence identity to a mTERT protein comprising SEQ ID NO:2.

30 7. The purified mTERT protein of claim 6, wherein the calculated molecular weight of the encoded mTERT protein is about 127 kDa.

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8. The recombinant mTERT protein of claim 6, wherein the mTERT protein has a sequence as in SEQ ID NO:2.

Sub 9. An isolated, purified or recombinant antibody, specifically immunoreactive under
 5 e1 immunologically reactive conditions, to the protein of claim 6.

10. A transfected cell comprising a heterologous nucleic acid encoding an mTERT protein or subsequence thereof.

10 11. The transfected cell of claim 10, into which an exogenous nucleic acid sequence has been introduced, the exogenous nucleic acid identical to or capable of specifically hybridizing under stringent conditions to a nucleic acid with a sequence as set forth in SEQ ID NO:1.

15 12. The transgenic cell of claim 11, or a non-human animal comprising such cell, and progeny thereof, wherein said cell or animal comprises an endogenous mTERT gene which has been mutated by recombinant means with a nucleic acid comprising at least a subsequence of a nucleic acid encoding an mTERT gene.

20 13. The transgenic cell or non-human animal of claim 12, wherein said cell or animal is deficient in at least one mTERT or telomerase enzyme activity.

14. The transgenic cell or non-human animal of claim 13, wherein said cell or animal completely lacks all mTERT or telomerase enzyme activity.

25 15. A method of determining whether a test compound is a modulator of telomerase reverse transcriptase activity, said method comprising the steps of:

- a) providing a composition comprising an mTERT;
- b) contacting the mTERT with the test compound; and
- c) measuring the activity of the mTERT, wherein a change in the TERT activity

30 in the presence of the test compound is an indicator that the test compound modulates the mTERT activity.

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16. The method of claim 15, wherein the composition comprises a buffered aqueous solution comprising a template polynucleotide, an mTERT, a buffered aqueous solution compatible with telomerase activity, and, sufficient additional nucleotide species necessary for telomerase-catalyzed polymerization of a DNA polynucleotide complementary to said template polynucleotide.

17. An expression vector comprising a nucleic acid sequence which specifically hybridizes under stringent conditions to a nucleic acid with a sequence as set forth in SEQ ID NO:1, or to a nucleic acid sequence encoding an mTERT protein, said protein defined as follows:

- (i) having a calculated molecular weight of between about 50 and 150 kDa; and
- (ii) (a) specifically binding to an antibody that binds a protein comprising SEQ ID NO:2, or a subsequence thereof; or
- (b) having at least 60% amino acid sequence identity to a protein comprising SEQ ID NO:2.

18. The expression vector of claim 17, wherein the vector is pGRN227.

19. The expression vector of claim 17, wherein the vector is pGRN188.

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